NOTE ON SCHULENBURG'S SOLUTION OF THE GENERAL EQUATION OF THE FIFTH DEGREE.

BY W. E. HEAL, WHEELING, INDIANA.

SCHULENBURG makes the solution of the quintic

$$x^5+p_2x^3-p_3x^2+p_4x-p_5=0,$$

depend upon that of the sextic

$$y^6-\tfrac{1}{4}q_2y^4+\tfrac{1}{16}q_4y^2-q_5y+\tfrac{1}{64}q_6=0.$$

(See ANALYST, Vol. IV, page 50, Eq. V.)

If from (1) and (4) of Eq. VIII (Vol. IV, pp. 51 and 52) we eliminate $\frac{1}{3}(a-20d_{\prime})$ we find

"IX. (1) Function $\alpha\beta\gamma\delta=0$; thus

(2) Function $A.\ B.\ C.\ D=N$ having been formed, N must $=0$."

I use the letters q_2, q_4, q_6, q_5 instead of A, B, C, D and I write "IX. (2)" thus;

$$F(q_2,\ q_4,\ q_6,\ q_5)=N.$$

If we write (1) and (4) of Eq. "VIII" in the form

$$a_1m^4+b_1m^3+c_1m^2+d_1m+e_1=0,$$
$$a_2m^4+b_2m^3+c_2m^2+d_2m+e_2=0,$$

and determine the eliminant $F(p_2,\ p_4,\ p_6,\ p_5)$, (see Salmon's Algebra, p. 396), it is readily seen that the term $a_1^4e_2^4$ does not vanish and therefore $F(p_2,\ p_4,\ p_6,\ p_5)$ cannot $=0$. Or, in other words, the equation $N=0$, which is assumed to be true by Schulenburg, is *not* true.

NOTE BY PROF. HYDE.—In my solution of Prob. 283, in the ANALYST for Jan. 1880, by inadvertence, a V was omitted from all the equations after the first which makes the results untrue. It should have been

$$V\alpha\rho+V\beta\rho\quad V(\alpha+\beta)\rho,$$

which contains the proof, since

$$UV\alpha\rho=UV\beta\rho=UV(\alpha+\beta)\rho,$$

(because α, β and ρ are coplanar), and therefore

$$TV\alpha\rho+TV\beta\rho=TV(\alpha+\beta)\rho,$$

when P is outside the parallelogram; and

$$UV\alpha\rho=-UV\beta\rho=\pm UV(\alpha+\beta)\rho, \text{ and}$$
$$\therefore TV\alpha\rho-TV\beta\rho=\pm TV(\alpha+\beta)\rho,$$

when P is inside. These tensors are the product required.